

PES-0043

REMARKS

Claims 2, 5 -- 10, 15 -- 25, 51 and 57 -- 67 are pending in the present Application. Claim 10 has been cancelled, Claims 8, 9, 18, 22, and 25 have been amended, leaving Claims 2, 5 -- 9, 15 -- 25, 51 and 57 -- 67, for consideration upon entry of the present Amendment.

Claims 9 and 18 were amended merely to place them in independent form. The scope of these claims was not changed due to these amendments.

Claims 22 and 25 have been amended to provide proper antecedent basis to "the first porous support". The scope of these claims was not changed due to these amendments.

No new matter has been introduced by these amendments or new claims. Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Claim Objections

Claim 10 is objected to under 37 CFR 1.75(c). Claim 10 has been cancelled, thereby rendering this objection moot. Reconsideration and withdrawal of this rejection are respectfully requested.

Claim Suggestions

Applicants would like to thank the Examiner for the claim suggestions. Claims 22 and 25 have been amended to provide proper antecedent basis for "the first porous support". Regarding Claim 25, the suggestion to include the term "further" before "comprises", Applicants respectfully decline since the polymeric material had just been introduced in the claim. No prior materials had been provided in the claim for the polymeric material. Hence, "further" does not seem warranted.

Claim Rejections Under 35 U.S.C. § 102(e)

Claims 8 and 57 -- 62 stand rejected under 35 U.S.C. § 102(e), as allegedly anticipated by U.S. Patent No. 6,030,718 to Fuglevand, et al. Applicants respectfully traverse this rejection.

To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Varient Inc.*, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987).

PES 0043

Claim 8 has been amended to clarify that the porous material includes the electrically conductive material. As is admitted in the Office Action, Fuglevand et al. at least fail to anticipate the electrically conductive material. Reconsideration and withdrawal of this rejection are respectfully requested.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 2, 5 – 10, 15 – 25, 51, and 57 remain rejected for substantially the reasons of record. Applicants continue maintain their objections to these rejections for all of the reasons set forth in the prior responses, which are incorporated herein by reference.

Claims 2, 5 – 7, 20, 21 and 63 – 67 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent No. 6,030,718 to Fuglevand, et al. in view of U.S. Patent No. 5,641,586 to Wilson, and International Publication No. WO 00/39363 A1 to Speranza et al. Claims 16 and 17 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Fuglevand, et al. in view of International Publication No. WO 97/13287 to Mussell et al., and further in view of Wilson. Applicants respectfully traverse these rejections.

These rejections are based upon the supposition that “Wilson indicates that metal screens and cloths are functionally equivalent to carbon cloths...” (Final Rejection dated December 13, 2005, hereinafter “FOA 12/05”) In response to Applicants’ contention that the porous structures are different and have different properties, the Examiner states that “in the context of using such porous structures as flow-field members in fuel cells, the disclosure of Wilson still indicates that these materials are interchangeable.” (FOA 12/05, page 9)

Actually, Wilson teach that

U.S. Pat. No. 4,129,685 to Damiano teaches the use of a thick layer of carbon foam to serve as a porous flow-field in a phosphoric acid fuel cell and, in one embodiment, in contact with a layer having relatively smaller pore sizes to prevent penetration of the catalyst into the pores. But there is no teaching about combining such a flow-field with a gas diffusion barrier or about the effects of water accumulation on the macroporous flow-field. The structures described herein typically form the macroporous flow-field from resin bonded carbon paper available, e.g., from Toray (Japan) or Spectracorp. This material is about 70% porosity, 30 μ m mean pore diameter, of various thicknesses. Other possible porous structures include carbon or metal foams, sintered particles, and woven or non-woven metal screens.

PES-0043

(Col. 4, line 65 -- Col. 5, line 12) In other words, Wilson does not state that carbon cloth and metal screens are functionally equivalent. Wilson teaches that different designs have different properties. They mention other possible porous structures, but do not elaborate on how these structures are used. Additionally, Wilson teach that they use carbon paper; "structures described herein typically form the macroporous flow-field from resin bonded carbon paper...". Merely the disclosure of a list of items that can be used in a particular invention (e.g., possible flow fields in Wilson), is not an affirmation that all of the elements of the list are equivalent.

The Examiner has argued that Wilson teaches that metal screens and cloths are functionally equivalent to carbon cloths, and further states that it should be obvious that sintering of the metal should improve the structural characteristics of the metal cloth. However, following the Examiner's logic, if metal screens and cloths are functionally equivalent to carbon, and sintering improves the structural capability of metals (so that it will "function better"), sintering should do the same for the "equivalent" structures, e.g., the carbon structures. However, sintering of carbon, which we don't believe will even sinter, will not improve the structural properties at all. In fact the structural properties of the carbon cloths can be substantially worsened. Carbon cloths are not be the functional equivalents of metal, and Wilson does not attempt to say they are equivalents.

As is further set forth in the prior responses and further explained above, there is no teaching that carbon cloth is equivalent to metal screens and cloths. Hence, there is no motivation to combine the references as suggested. No *prima facie* case of obviousness has been established. Reconsideration and withdrawal of these rejections are respectfully requested.

Claims 15, 22 -- 25 and 51 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent No. 6,030,718 to Fuglevand, et al. in view of International Publication No. 97/13287 to Mussell, et al. Applicants respectfully traverse this rejection.

The Examiner relies on Fuglevand et al. to teach porous flow field members having a hydrophilicity gradient. The Examiner further relies on Mussell et al. to teach flow field members having two layers of porosity. The Examiner contends that page 4, line 11, of Mussell et al. teach that:

PES-0043

It has been discovered that the fuel cell of the fourth and fifth aspects of the invention as well as fuel cells prepared by the process of the sixth aspect of the invention are able to operate at high current density at relatively high voltage, have a relatively high power density, and provide a high power density even when operated under relatively low gas pressures.

The Examiner further contends that an artisan would be motivated by this passage of Mussell et al. to vary the porosity across the plurality of layers of Fuglevand et al, and that it would be obvious to substitute the metal screens or sintered metal cloths of Wilson for the carbon paper of Fuglevand.

Mussell et al. are directed to particular flow field structures for membrane electrode assemblies (MEA). These flow field structures are adjacent to the MEA. (Page 1, lines 3 - 4) Mussell et al. are directed particularly to the flow field and state that it is a layer of electrically conductive porous material and it may comprise porous carbon material. (Page 5, lines 18 -- 23) Suitable examples of porous carbon materials are provided as including carbon paper, graphite paper, carbon felts, or other carbon-based compositions. (Page 5, lines 32 - 35)

Fuglevand et al. specifically teach

the first diffusion layer 171 which is affixed thereto comprises a coating of particulate carbon suspended in a binding resin. Further, the second diffusion layer 172 comprises preferably a porous hydrophobic carbon backing layer.

(Col. 9, lines 40 - 45) There is no motivation to change these specific teachings of these references. Since each reference specifically teaches a desired design, there is no motivation or expectation of success to ignore that references' teaching for a teaching of another reference. The standard is not what an artisan could do, what an artisan might do, or even what might be "obvious to try", but is what an artisan would be motivated to do with an expectation of success based upon the teachings of the prior art. A finding of "obvious to try" does not provide the proper showing for an obviousness determination. The requirement for a determination of obviousness is that "both the suggestion and the expectation of success must be founded in the prior art, not in applicant's disclosure" (emphasis added). *In re Dow Chem.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988). An Examiner, then, cannot base a determination of obviousness on what the skilled person in the art might try or find obvious to try. Rather, the proper test requires determining what the prior art would have led the skilled person to do.

PES-0043

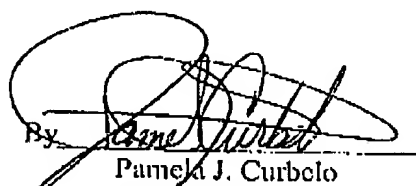
Carbon paper and cloths are not equivalents to metal screens and cloths. There is no motivation to ignore the specific teachings of the layers 171 and 172 of Huglevand et al. and no expectation of success. Merely mentioning carbon and metal is not an affirmation that they are functional or practical equivalents. No *prima facie* case of obviousness has been established. Reconsideration and withdrawal of this rejection are respectfully requested.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and withdrawal of the objections and rejections and allowance of the case are respectfully requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

CANTOR COLBURN LLP

By 
Pamela J. Curbelo
Registration No. 34,676

Date: March 8, 2006
CANTOR COLBURN LLP
55 Griffin Road South
Bloomfield, CT 06002
Telephone (860) 286-2929
Facsimile (860) 286-0115
Customer No.: 23462